

ECONOMIC GEOLOGY

The Ranchester quadrangle was mapped as part of the U.S. Geological Survey's program of classifying and evaluating mineral lands in the public domain. The regional geology of the area was mapped and discussed by Darton (1906a, b). Resources of economic interest within the quadrangle include subbituminous coal, sand and gravel, and ground water. Oil and gas may occur at depth.

Coal beds of economic thickness are found locally within the Lebo Shale Member of the Fort Union Formation. Coal bed *a*, mapped in the northwest corner of the quadrangle, is as much as 5.5 feet (2 m) thick; it is about 600 feet (183 m) stratigraphically below the top of the Lebo. Coal bed *b*, near the top of the member, usually consists of several feet of carbonaceous shale interbedded with thin coal; this bed locally contains a maximum of 3-4 feet (0.9-1.2 m) of coal. Thicker and more continuous coal beds are found within the Tongue River Member. The Carney coal bed, at the base of the Tongue River, and the Slater Creek coal bed are both generally 3-12 feet (0.8-4 m) thick in the northeastern part of the quadrangle. Fresh samples of the Carney coal bed collected from mine workings about 6 miles (10 km) east of the quadrangle by Taft (1909, p. 135) had a heat value averaging about 9,500 British thermal units (2,400 kcal) on an as-received basis and a sulfur content averaging about 0.5 weight percent. The Monarch coal bed is bumed everywhere in the quadrangle except in the southeast corner of the area, where the bed is split into westward thinning benches separated by several feet of mudstone. The coal beds herein designated "Carney" and "Monarch" are correlated with the beds mined in the abandoned Carney and Monarch underground coal mines (Taft, 1909) about 5 miles (8 km) east of the quadrangle. The Slater Creek coal bed, which occurs between the Carney and Monarch beds in the drainages of Slater and Early Creeks, may represent a lower split of the bed mined in the Monarch coal mine.

Two exploratory holes were drilled in the northeastern part of the quadrangle in September 1973 under a U.S. Geological Survey grant to the Montana Bureau of Mines and Geology. The first of these holes, BMC 72-11 (sec. 17, T. 58 N., R. 85 W.), penetrates a thick sequence of coal which is preserved in a small downfaulted block. The Monarch coal bed is about 47 feet (14.3 m) thick in this hole. Another thick coal bed of uncertain correlation occurs about 20 feet (6 m) above the Monarch bed. A chip sample of coal from this bed was determined to have a heat value of 8,085 British thermal units (2,037 kcal) and a sulfur content of 0.26 weight percent (as received) by the Montana Bureau of Mines and Geology laboratory. In the second hole, BMC 72-12 (sec. 20, T. 58 N., R. 85 W.), thick coal beds are burned, producing the interval of baked rocks typical of this area. Driller's logs and analytical data on the chip sample collected are available in open files of the U.S. Geological Survey (U.S. Geol. Survey and Montana Bur. Mines and Geol., 1973).

Oil is produced from the Shannon Sandstone Member of the Steele Shale in the Ash Creek and Ash Creek South fields about 4 miles (6.4 km) east of the quadrangle. Four unsuccessful tests to the Shannon Sandstone Member have been drilled within the quadrangle, but the Shannon Member of the Steele and several deeper formations remain potential sources of oil and gas. The Quaternary deposits generally supply adequate sand and gravel for road building, particularly valuable are the pediment deposits in the southwestern part of the quadrangle. Baked mudstone is used for road metal in many places. The baked rocks of the Tongue River Member in the northeastern part of the quadrangle are a potential source of this material.

Ground water for domestic and stock use is generally derived from sandstones within the Fort Union Formation and from Quaternary deposits. Several deeper formations are potential aquifers. The ground-water resources of the general area were discussed by Lowry and Cummings (1960).

REFERENCES CITED

Darton, N. H., 1906a, Description of the Bald Mountain and Dayton quadrangles, Wyoming: U.S. Geol. Survey Geol. Atlas, Folio 141, 15 p.

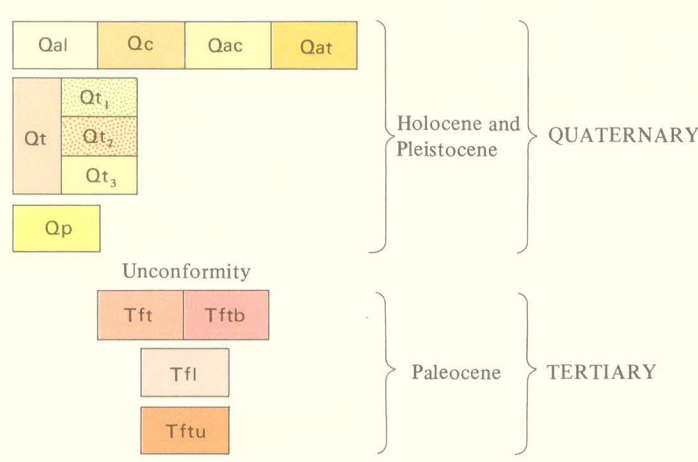
—, 1906b, Geology of the Big Horn Mountains: U.S. Geol. Survey Prof. Paper 51, 129 p.

Lowry, M. E., and Cummings, T. R., 1960, Ground-water resources of Sheridan County, Wyoming: U.S. Geol. Survey Water-Supply Paper 1807, 77 p.

Taft, J. A., 1909, The Sheridan Coal Field, Wyoming: U.S. Geol. Survey Bull. 341-B, p. 123-150.

U.S. Geological Survey and Montana Bureau of Mines and Geology, 1973, Preliminary report of coal drill-hole data and chemical analyses of coal beds in Sheridan and Campbell Counties, Wyoming, and Big Horn County, Montana: U.S. Geol. Survey open-file report, 57 p.

CORRELATION OF MAP UNITS

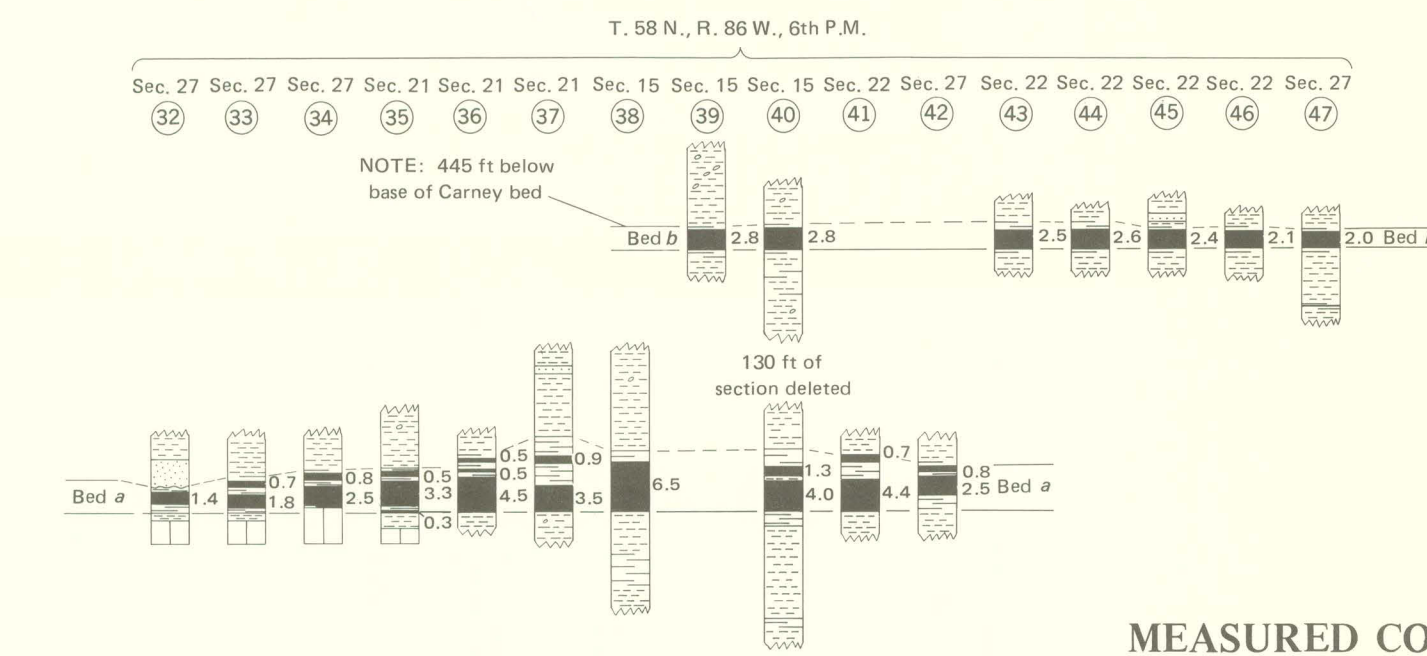
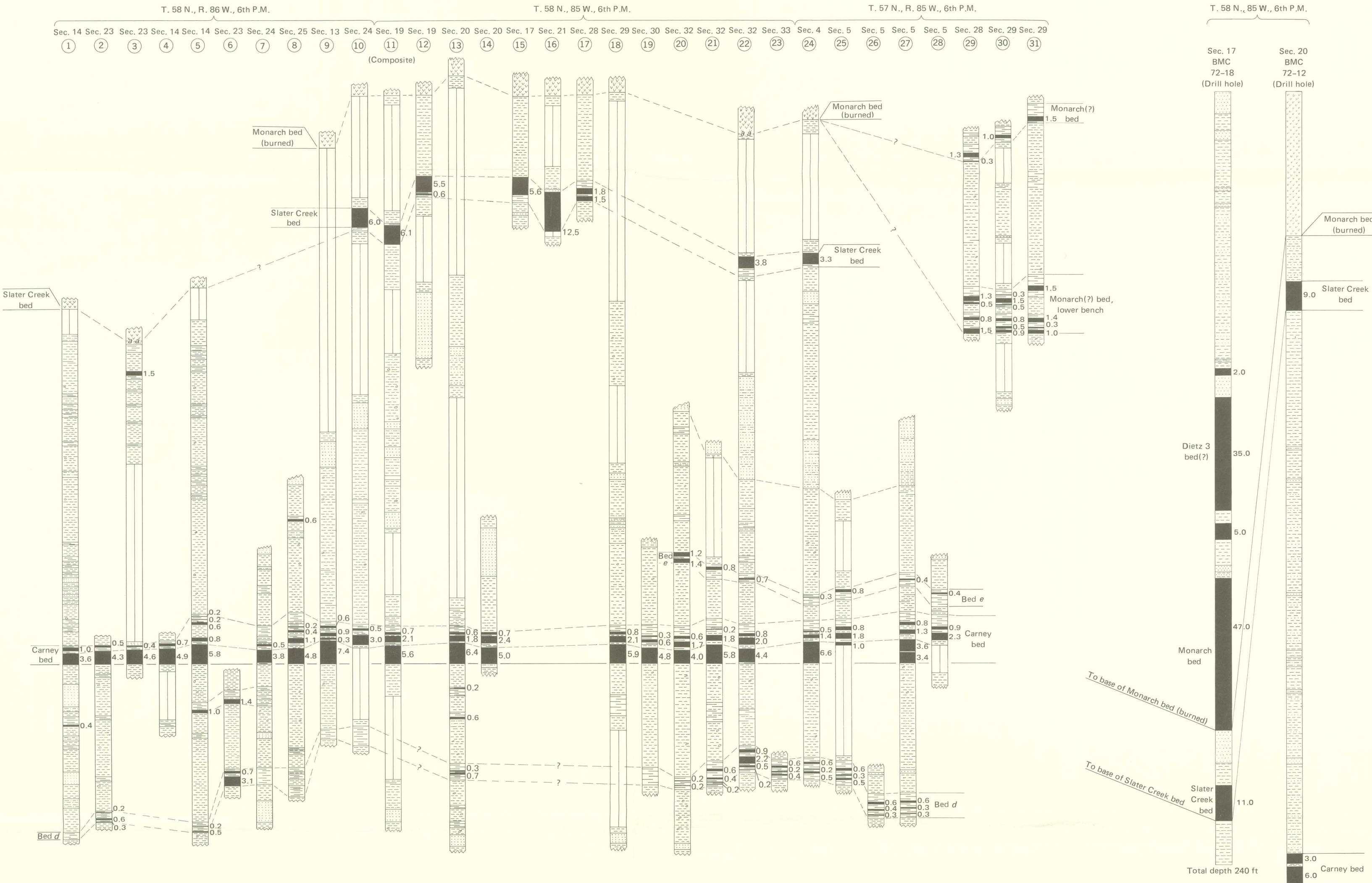


LIST OF MAP UNITS

- Qal ALLUVIUM
- Qc COLLUVIUM AND SLOPE WASH
- Qac ALLUVIUM, COLLUVIUM, AND SLOPE WASH, UNDIFFERENTIATED
- Qat ALLUVIUM AND LOW TERRACE DEPOSITS, UNDIFFERENTIATED
- Qt TERRACE DEPOSITS, UNDIVIDED
- Qt1 Terrace deposits
- Qt2 Terrace deposits
- Qt3 Terrace deposits
- Qp PEDIMENT DEPOSITS
- Fort Union Formation
 - Tt Tongue River Member
 - Ttb Tongue River Member (baked)
 - Tt Lebo Shale Member
 - Ttu Tullock Member

- COAL BED - Approximately located; short dashed where inferred; dotted where concealed. Thickness of thin coal, in feet, measured at triangle. Number in circle refers to location of measured coal section. Letter symbol indicates identification of coal bed: m, Monarch bed; ml, Monarch(?) bed, lower bench; sl, Slater Creek bed; c, Carney bed; sc, carbonaceous shale beds containing very little coal, mapped locally for structural control. Coal beds shown within or directly underlying baked rock units are burned and are represented by ash.
- CONTACT - Approximately located; short dashed where inferred; dotted where concealed.
- FAULT - Approximately located; short dashed where inferred; dotted where concealed. Bar and ball, showing approximate vertical displacement, in feet, on downthrown side.
- STRUCTURE CONTOURS - Drawn on base of Monarch coal bed within Tongue River Member of Fort Union Formation. Short dashed where projected over land surface. Contour interval 50 ft (15.2 m); contour interval in southwestern part of mapped area 100 ft (30.5 m).
- STRIKE AND DIP OF BEDS
- ABANDONED OIL AND GAS TEST HOLE - Showing operator and lease name and total depth, in feet
- ABANDONED COAL MINE
- GRAVEL PIT
- SMALL EARTHFILL DAM
- U.S. GEOLOGICAL SURVEY COAL DRILL HOLE

¹ To convert feet to metres, multiply by 0.3048.



MEASURED COAL SECTIONS AND DRILL HOLES

GEOLOGIC MAP AND COAL RESOURCES OF THE RANCHESTER QUADRANGLE, SHERIDAN COUNTY, WYOMING, AND BIG HORN COUNTY, MONTANA

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